PCT/EP2003/004331

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference B02/0687PC	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/004331	International filing date (*day/month/year*) 25 April 2003 (25.04.2003)	Priority date (*day/month/year*) 18 September 2002 (18.09.2002)
International Patent Classification (IPC) or national classification and IPC C07C 41/03		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand 20 October 2003 (20.10.2003)	Date of completion of this report 05 August 2004 (05.08.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/004331

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-25, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement under Article 19

pages _____, filed with the demand

pages 1-9, filed with the letter of 12.03.2004

☐ the drawings:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-7	YES
	Claims	8-9	NO
Inventive step (IS)	Claims	1-7	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims		NO

2. Citations and explanations

D1: WO 94/11330

D2: US 2 508 036

D3: WO 00 74845

D4: WO 94/11331

1. Amendments (PCT Article 34(2)(b))

The initiator compound is now defined in claim 1 as a monofunctional linear or branched alcohol with 2-24 carbon atoms (originally claim 5). Such an amendment is allowable, since it satisfies the criteria of PCT Article 34(2)(b).

2. Novelty (PCT Article 33(2))

1_1. Process

D1 and **D2** describe the preparation of 2-propyl heptanol ethoxylates from 2-propyl heptanol and 1,2-epoxyethane in the presence of KOH as the catalyst at reaction temperatures of 70-180°C (**D1**) and 150-160°C (**D2**). These products are used for cleaning textile materials.

Metal-cyanide complex compounds of the formula (I) are known from **D3**, which describes their use in the preparation of polyetherols from, for example, 1,2-propanediol and 1,2-epoxypropane.

The novelty of claims 1-8 over **D1-D3** is therefore acknowledged.

1₂. Product and use

Alkoxylates and the use thereof as emulsifiers, antifoaming agents or wetting agents for hard surfaces are known from **D4**. The subject matter of claims 8 and 9 is therefore not novel. Such claims may be worded as "product by process" claims only if the process characterizes the product. It must therefore be demonstrated that the proportion of residual alcohol in these alkoxylates differs from that associated with any other alkoxylation process and leads to products having improved emulsifying properties. Example 15 shows that increasing the reaction temperature to 160°C also enables alkoxylates with such properties to be prepared!

2. Inventive step (PCT Article 33(3))

The process described in **D1** or **D2** differs in that an alkali hydroxide is used as the catalyst instead of a double metal cyanide (DMC) complex compound. The problem addressed by the present invention is that of providing a process for alkoxylating initiator compounds in which induction time is shortened and catalyst stability and activity, reaction rate and conversion are improved. The solution consists in the process as per claim 1, comprising the steps of

bringing into contact at least one alkylpropylene oxide selected from a group consisting of 1,2-epoxyethane, 1,2-epoxypropane, butylene oxide, pentylene oxide and decene oxide and at least one monofunctional linear or branched alcohol having 2-24 carbon atoms as the initiator compound in the presence of at least one DMC compound of the formula (I), wherein the reaction takes place at a temperature of 130-155°C.

The process according to the invention enables accelerated alkoxylate preparation rates: for example, high yields of alkoxylates are made possible after a reaction time of 2 hours (examples 5-16). The induction time of the reaction at 140°C is 5 minutes, favourably influencing the reaction (comparative example 1, page 19 of the description). The use of DMC compounds instead of alkali hydroxides is known (**D3**) in relation to the preparation of polyether alcohols from alkylpropylene oxide, not to that of alkoxylates having low contents of unsaturated constituents. The wide differences in parent compounds between **D1** and **D2** and **D3** do not suggest a possible combination to a person skilled in the art. Consequently, the process as per claims 1-7 involves an inventive step.